

**CLAIMS**

What is claimed is:

1. A method for predicting and applying painting parameters so that predetermined painting responses are produced, said method comprising:
  - 5 a. preparing a painting parameter-response model, said model interrelating at least one painting parameter with at least one painting response via a painting parameter-response algorithm;
  - b. predetermining at least one painting parameter to input into said parameter-response algorithm of said model;
  - 10 c. determining at least one target painting response based upon said parameter-response algorithm of said model and upon said parameter or plurality of parameters; and
  - d. applying any said parameter or plurality of parameters to the painting equipment in such way as to obtain said painting  
15 response or plurality of painting responses.
2. A method for predicting and applying painting parameters so that predetermined painting responses are produced, said method comprising:
  - 20 a. preparing a painting parameter-response model, said model interrelating at least one painting parameter with at least one painting response via a painting parameter-response algorithm;
  - b. predetermining at least one target painting response to input into said parameter-response algorithm of said model;
  - 25 c. determining at least one painting parameter based upon said parameter-response algorithm of said model and upon said response or plurality of responses; and
  - d. applying any said parameter or plurality of parameters to the painting equipment in such way as to obtain said painting  
30 response or plurality of painting responses.
3. The method of claim 1 or 2 wherein said painting parameter-response model is based upon a design of experiments interrelating said painting parameters with said painting response.

4. The method of claim 1 or 2 wherein said painting parameter-response model includes interrelating a plurality of painting parameters with a plurality of painting responses.

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5. The method of claim 1 or 2 which includes a computer-human interface for inputting said painting response, inputting permissible level ranges for said painting parameters, and determining painting parameters.

10 6. The method of claim 1 or 2 wherein said plurality of paint responses comprise spray pattern diameter and average spray pattern film build

7. The method of claim 6 which further comprises spray pattern shape as a paint response.

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8. The method of claim 7 which further comprises transfer efficiency as a paint response.

9. The use of the method of claim 1 to determine painting parameters.

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10. The use of the method of claim 1 to determine initial setpoints for painting parameters.

25 11. The use of the method of claim 1 to compare paint application equipment or equipment components.